

REMARKS

Claims 42 – 48, 50, 51, and 55 – 57 are pending and under consideration in the above-identified application, and Claim 1 – 41 and 52 – 54 were previously cancelled.

In the Office Action, Claims 42 – 48, 50, 51, and 55 – 57 were rejected.

In this Amendment, Claims 42, 50, 51, 55, 56 and 57 are amended. No new matter has been introduced as a result of this Amendment.

Accordingly, Claims 42 – 48, 50, 51, and 55 – 57 remain at issue.

I. 35 U.S.C. § 112 First Paragraph Rejection of Claims

Claims 42 – 48, 50, 51 and 55 - 57 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Claim 42 has been amended by replacing “--CH₂PO(OH)₃” with “--CH₂PO(OH)₂” which is supported in the specification. See at least Paragraph [0032].

In view of this amendment, Applicants respectfully request that the claim rejections be withdrawn.

II. 35 U.S.C. § 112 Second Paragraph Rejection of Claims

Claims 42 – 48, 50, 51, and 55 – 57 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim 42 has been amended to remove the ambiguity of the phrasing “into which” and clearly recite that the ionic groups are introduced into the polymer, and to substitute “conjugate diene” with “conjugated diene.”

In response to the rejection of Claim 56, Applicants have amended the limitation at issue to recite that the polymer is obtained by processing used resin with an acid and/or an alkali.

Claim 51 has been amended to become dependent on Claim 56, thereby removing the issue of the lack of a proper antecedent basis.

Due to the amendment of Claim 42 where the term “high molecular material” has been replaced by the term “polymer”, this recitation of this later term in Claim 57 now does have a proper antecedent basis. Moreover, in Claim 57 the recitation “molded the resulting mixture” has been replaced with the following one “a resulting mixture is molded into a pre-set shape” to mitigate the issue of antecedent basis.

Accordingly, Applicants respectfully request that these claim rejections be withdrawn.

III. 35 U.S.C. § 102(b) and 103(a) Rejection of Claims

Claims 42– 44, 48, 50, 51, and 55 – 57 were rejected under 35 U.S.C. § 102 (b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being obvious Horwitz et al. (“Horwitz”) (U.S. Patent No. 5,281,631).

Claim 42 is directed to a cleansing method.

In relevant part, Claim 42 recites:

“...a polymer having 20 to 50 mol % of acrylonitrile and 50 to 80 mol % of at least one of styrene and conjugated diene as constituent unit, and into the polymer are introduced ionic groups
said ionic groups are at least one selected from the group consisting of carboxylic acid groups, hydroxy groups, --PO(OH)₂ groups, --CH₂PO(OH)₂ groups, --NO₂ groups or salts thereof...”

That is clearly unlike Horwitz.

In support of the claim rejection, the Examiner has again pointed to the entire Horwitz reference, and specifically to columns 1 to 4 and Examples 1, 4 and 5. However, Applicants maintain that nowhere does Horwitz fairly teach or suggest that the introduced ion groups are at least one selected from the group consisting of carboxylic acid groups, hydroxy groups, --PO(OH)₂ groups, --CH₂PO(OH)₂ groups, --NO₂ groups or salts thereof.

Horwitz discloses a polymeric ion exchange resin for extracting metal ions from a liquid waste stream which includes a first polymerizable component selected from the group consisting of vinylidene diphosphonic acid and alkyl/aryl esters of said diphosphonic acid. The disclosed vinylidene diphosphonic acid has a chemical structure that is similar to only “--PO(OH)₂ groups. However, Horwitz fails to teach or suggest other chemical structures such as carboxylic acid groups, hydroxy groups, --CH₂PO(OH)₂ groups, --NO₂ groups, as required by Claim 1.

Further, Horwitz teaches that ion-exchange resin is manufactured by copolymerizing phosphonic acid monomer with comonomer, like styrene and acrylonitrile. However, Horwitz fails to fairly teach or suggest that phosphonic acid and phosphate are introduced into copolymer of acrylonitrile, styrene, as required by Claim 1. Moreover, Horwitz teaches polymerizing monomer that already includes ionic group, i.e. a polymerization reaction, but fails to teach or suggest introducing ionic groups into a polymer having no ionic group, i.e. a macromolecular reaction.

In addition, as required in Claim 57 the polymer is mixed into a starting material composed at least of wood, plastics, paper, glass and metal, and a resulting mixture is molded to a pre-set shape. That is, the present invention uses universal plastics, whereas Horwitz only teaches the use of monomer unit of “vinylidene diphosphonic acid” as an essential component and does not teach or suggest using universal plastic. Moreover, because of the use of universal plastic the claimed ion-exchange resin does not include cross-linking agent, which enables optimum ionic group induction rate as well as optimum molar weight, whereas Horwitz teaches polymerizing with cross-linking agents and thus has no optimum weight molecular weight.

Thus, Claim 42 is patentable over Horwitz, as are dependent Claims 43 – 44, 48 -51, and 55 – 57, for at least the same reasons.

Accordingly, Applicants respectfully request that the 102(b) and 103(a) claim rejections be withdrawn.

IV. 35 U.S.C. § 103 Obviousness Rejection of Claims

Claims 45- 47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Horwitz and Grant et al. (“Grant”) (U.S. Patent No. 5,242,503).

Claims 45- 47 are dependent on Claim 42, shown above to be patentable over Horwitz.

Moreover, in addition to Horwitz, Grant also fails to teach or suggest a polymer having 20 to 50 mol % of acrylonitrile and 50 to 80 mol % of at least one of styrene and conjugated diene as constituent unit, that into the polymer are introduced ionic groups, and that the ionic groups are at least one selected from the group consisting of carboxylic acid groups, hydroxy groups, --PO(OH)₂ groups, --CH₂PO(OH)₂ groups, --NO₂ groups or salts thereof.

Therefore, Horwitz and Grant may not properly be combined to reject Claim 42. As such, Claim 42 is patentable over Horwitz and Grant, as are dependent Claims 45 - 47, for at least the same reasons.

Accordingly, Applicants respectfully request that these claim rejections be withdrawn.

V. Conclusion

In view of the above amendments and remarks, Applicant submits that Claims 42 – 48, 50 – 51 and 55 – 57 are clearly allowable over the cited prior art, and respectfully requests early and favorable notification to that effect.

If the claims are not found to be in condition for allowance, the Examiner is requested to contact the undersigned to schedule an interview before the mailing of the Office Action. Any communication initiated by this paragraph should be deemed an Applicant initiated interview.

Respectfully submitted,

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